

Case Statement

For more than 75 years, the March of Dimes has been a powerful force for improving the health of infants, children and their families.

The March of Dimes was founded in 1938 by Franklin Delano Roosevelt to eradicate poliomyelitis. At the time, polio was a terrifying and mysterious childhoodcrippler that paralyzed tens of thousands, including FDR himself. In response, the March of Dimes mobilized an effort that was unheard of in the history of medical philanthropy. After funding a nearly 20-year effort to develop an effective vaccine and building a second-to-none grassroots volunteer force, the March of Dimes provided for the vaccination of hundreds of millions of children and adults. In doing so, the March of Dimes fulfilled its original charter: the practical elimination of polio in the

United States and many other countries in the world. This legendary accomplishment proved to be just the first of many for the March of Dimes.

We have since become a model for other like-minded organizations, but none have come close to matching our scale or impact. After our success in developing the polio

vaccine, the March of Dimes has focused its considerable resources, motivation and influence on one important initiative after another, focusing public attention on and championing such issues as prevention of fetal alcohol syndrome; the benefits of folic acid; vital funding and collaboration for the elimination of rubella; and guidelines for newborn screening as pioneered by our former Vice President and Chief Medical Officer, Dr. Virginia Apgar. The March of Dimes also identified the need and therapeutic potential of human genetics for diagnosis and prevention, and funded groundbreaking research into the causes of birth defects and childhood genetic diseases. Technological advances, such as gene sequencing were developed out of this funding and set the stage for the acceleration of contemporary molecular

biology in research and treatment. These efforts and many others have produced dramatic reductions in birth defects, and the general improvement in the lives and health of countless children and families the world over. In 2003, in response to the news that the United States has the highest preterm birth rate of any developed nation, the March of Dimes made a public commitment to take up another seemingly impossible challenge: to understand and eliminate this country's most serious infant health problem, premature birth.

This is what we do.

This is what we've always done.

As one of the world's most effective organizations focused on improving the health of infants and children, the March of Dimes is uniquely qualified to lead this effort. Identifying the fundamental causes and the solutions to the problem of premature birth is now the main research priority for the March of Dimes. We're not looking merely for incremental advancements, either, but rather breakthrough research discoveries that will do for prematurity what the vaccine research we funded did for the eradication of polio. This is something for which we have assembled the expertise to succeed, and something we have done before—in fact, since 1954, our investment in research has led to the awarding of the Nobel Prize to 13 different scientists whose original work

Premature birth is the
#1
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1 in 10 babies
is born prematurely

The annual cost of prematurity in the United States is more than
\$26 billion



15 million children
are born prematurely every year worldwide

was supported by our grants. Now, we're putting everything we know about how to support scientific inquiry into this effort.

Prematurity is the leading cause of newborn death in this country and in the rest of the world.

In the United States, premature birth (before 37 completed weeks of gestation) affects half a million babies every year. This country's prematurity birth rate ranks as the highest of any developed nation—approximately 1 in 10 live births—almost twice as high as the rate of premature birth in Sweden. U.S. healthcare and associated costs for prematurity are estimated at more than \$26 billion dollars annually. Worldwide, 15 million babies a year are born prematurely, with one million of them dying before their first birthday. Premature birth and its complications are now the leading worldwide cause of death for children birth to age 5 years.

The consequences of premature birth are more far-reaching, serious and costly than most people realize.

Even with all the medical technology we have to treat premature babies—and we surely have some of the world's most advanced—those who survive often face lifelong health problems, including learning disabilities, vision and hearing impairment and cerebral palsy. Even babies born just a few weeks early have higher rates of illness and hospitalization than full-term infants, and when they do get sick, they stay sick longer and take longer to recover. Their problems aren't over when they grow up, either, because the effects of being born too soon often last throughout their adult lives.

Transdisciplinary Research: how to find a definitive answer to an indefinite problem.

No one knows what causes a woman to go into labor at a particular time, premature or otherwise. But we suspect premature birth has been around as long as human beings. At present, it is just as likely to occur in women who have had otherwise completely normal and healthy

pregnancies, as in women who have known risk factors. Premature birth cuts across races, nationalities, cultures, ages, income and education levels, and geographies. It has multiple causes, how many is anyone's guess, and they may interact in a yet to be determined number of ways.

After making initial forays into various research areas that seemed to have been related to the causality of premature birth—with disappointing results—the March of Dimes realized that the solution to such an extraordinarily complex problem was not going to be found through the traditional research approach. After all, premature birth is not a virus or a bacterium; and its agent can't be isolated in a lab. It's a problem, a mystery, really, with so many clues and potential causes it can only be unraveled by taking a collaborative approach that integrates many disparate disciplines, and brings together their collective forces of intellect, knowledge, experience and technology to bear on finding a solution. This approach is called transdisciplinary research.

The March of Dimes Prematurity Research Centers. Extraordinary effort in service of an extraordinary cause.

To reach our goal of solving the mystery of premature birth, the March of Dimes set about building the infrastructure that would facilitate the dynamic environment transdisciplinary research demands. This infrastructure would be comprised of existing centers of excellence in their own right, but when integrated with others, forms a framework for collaboration and discovery on a large scale. The first center opened in 2011, the March of Dimes Prematurity Research Center at Stanford University.

In the following five years, we opened four more centers. The second, the Ohio Collaborative, was launched in 2013, and involves three major Ohio universities (Cincinnati, Ohio State, Case Western Reserve). In 2014, we added centers at the University of Pennsylvania and at Washington University in St. Louis. The last center, a collaboration involving the University of Chicago, Northwestern and Duke, launched in mid-2015.

March of Dimes Campaign To End Premature Birth—Case Statement

This strategy of discrete research centers working together for a single goal represents the most focused, and the most diverse mobilization of scientific expertise ever brought to bear on the elimination of prematurity. This network combines experts in various fields—not just pediatricians, obstetricians and gynecologists, but physiologists, informaticians, sociologists, data analysts, internists, physicists, geneticists, engineers and technologists, many of whom had never even considered working on premature birth before.

Each Prematurity Research Center has two things in common with the others: They are all studying something that plays a role in initiating labor. And they are working together to find what causes labor to occur prematurely—and prevent it.

What secret signal triggers process of birth? What causes a child to be born at one particular time and not another? We know of important changes in musculature, cell make-up, hormone levels that occur when the process

Premature birth is a leading cause of lasting childhood disabilities, such as learning and vision problems and cerebral palsy.

begins, but we don't know why they start at once, or don't, or start too early. What role does genetics play? What about environmental factors? Education? Upbringing? Physical conditioning? Pollution? Stress? Prenatal care? If premature birth rates in one country are low, why are they higher in the country right next door? And just to

complicate matters even further, what is the interaction of all these factors?

This is why we created the Prematurity Research Centers. To find the answers to these questions, and many more.

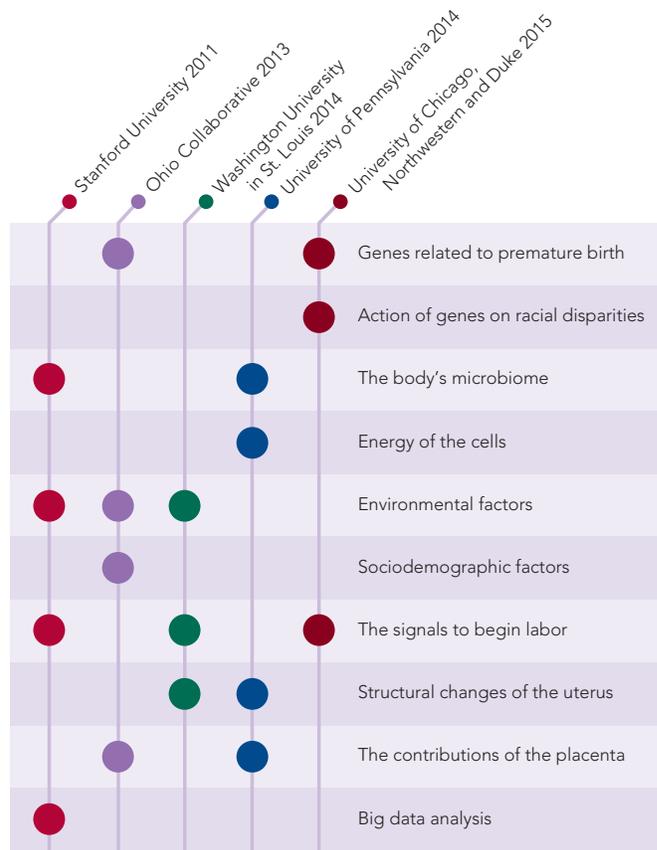
In the decades that medicine has been studying human reproduction, we have learned that there are a multiple of factors that combine to cause a woman to give birth. But we have also learned that studying those factors individually doesn't lead anywhere. That much we know. And that realization has led us to this: These factors need to be studied in concert and in parallel, with the knowledge that there probably isn't going to be just one answer to premature birth, but rather a combination of factors that will apply—and will need to be adjusted—for treatment and prevention.

One Cause. Five March of Dimes Prematurity Research Centers Connecting Multiple Research Themes.

The March of Dimes selected each of the centers on the basis of their expertise in particular areas, their proximity and access to tangential resources, and their connectivity—their ability to integrate their work with the complementary work being done by the other centers. Because we want each center to pursue the Research Themes we've laid out for them, their findings will inform and amplify the Themes the other centers are pursuing.

The Questions We Need To Ask: The March of Dimes Prematurity Research Centers and Their Themes.

Our network of March of Dimes Prematurity Research Centers brings together some of the best minds in science, medicine, engineering and technology. These different disciplines not only connect and collaborate with each other on the multiple causes of prematurity, but also share new methods of discovery. Different specialists working together are able to absorb how the other disciplines approach the same problem, and use different tools and methods to look at and eventually solve the problems in their own field in a different way.



March of Dimes Campaign To End Premature Birth—Case Statement

Nearly
half a million
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annually

It's this kind of cross-fertilization that makes the transdisciplinary approach so valuable, and particularly so with a problem with the size and complexity of premature birth.

We chose the Prematurity Research Centers because each center's expertise fit into a matrix of potential causes of premature birth, and as such, they have the best people in those particular fields needed to solve the problem.

How collaboration happens among the Centers.

The transdisciplinary approach of our five Prematurity Research Centers is not necessarily unique—other fields of endeavor have used it to some degree as a collaborative model to solve complex problems. But it certainly is uncommon, particularly in the fields of medicine and medical research. Yet we believe that a problem as complicated as premature birth is simply too big and multi-factored to be tackled any other way. We need disparate disciplines focused on the various identified research themes to accomplish our common goal.

That collaboration takes many forms, and happens constantly. By working closely with other specialties, researchers begin to appreciate how others solve problems and as a result, take a more rounded view of their own piece of the puzzle. For instance, different scientists have different skill sets; engineers aren't necessarily the ones developing a solution, but are charged with "scaling" and delivering it. By being exposed to each other's thinking, everyone comes away with a more thorough and richer understanding, not only of the unique perspectives of the other specialties, but more importantly, the needs of the patients and families being treated.

Researchers working in the same areas communicate freely and informally as often as needed to share new developments and findings. These loosely affiliated teams meet in person formally approximately once a month, as do the staffs of the individual Centers, and the entire initiative (75 investigators) convenes, under the auspices of an Advisory Committee once a year.

The March of Dimes will continue to orchestrate this initiative, raising the money needed to fund this effort, and will provide the oversight necessary through our Advisory Council to see this through, just as we've always done. It's time to end prematurity, once and for all. And not a moment too soon.

We want to give every baby a fighting chance.

In one way or another, sooner or later, prematurity affects us all. It is a problem that speaks directly to who and what we are, and affects something so fundamental, so basic to our natures that we must all share in its resolution. Likewise, the answer to premature birth—and there will be an answer—will benefit us all. We will finally know, not just what causes premature birth, but full term births, too. That knowledge will translate to advances in nutrition, education, health care and an improved standard of living because a better start for some babies and their families means a better start for us all. So help us give every baby a fighting chance. Please join us in our cause to eliminate non-medically indicated premature birth. We at the March of Dimes, and millions of babies around the world about to be born too soon, are counting on you.

For more information on how you can be a part of this effort, please contact

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campaign to end premature birth

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